

Pilot: Nathan Thatcher Ulrich

PILOT LOGBOOKS FORENSIC EXAMINATION

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Contents

NTSB Preliminary Report Summary	3
Introduction	4
Logbooks Examined	5
Logbook 1	5
Logbook 2	ε
Private Pilot Flight Training	7
High Performance Airplane Pilot Flight Training	7
Complex Airplane Pilot Flight Training	7
Instrument Airplane Pilot Flight Training	7
Commercial Pilot Flight Training	8
Multi-Engine Pilot Flight Training	8
FAA Logbook Investigation	10
Multi-Engine Experience Post-Rating	13
N220N Mitsubishi MU-2 Flight Training	14
Mitsubishi MU-2B Pilot Proficiency Endorsement	15
Mitsubishi MU-2B Training Course Completion Endorsement	15
High Altitude Training	16
Post Mitsubishi MU-2 Ground and Flight Training	16
Summary	16

NTSB Preliminary Report Summary

On May 15, 2017, at 1339 eastern daylight time, radar and voice communication were lost with a Mitsubishi MU2B-40 airplane, N220N, over international waters near Eleuthera, Bahamas. Debris associated with the airplane was found floating amidst a fuel sheen the following day. The United States Coast Guard conducted a search by air and sea for 3 days, but the commercial pilot and three passengers were not found. The airplane departed Rafael Hernandez Airport (TJBQ), Aguadilla, Puerto Rico, about 1100 hr and was destined for Space Coast Regional Airport (TIX), Titusville, Florida. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the personal flight, which was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to Federal Aviation Administration (FAA) records, the airplane was a recent purchase, and registered January 23, 2017. A review of the airplane's flight history revealed that it was flown on the same route as the accident flight several times during the 4 months that the pilot operated the airplane.

Preliminary radar and voice communication information from the FAA revealed the airplane departed TJBQ, climbed to FL240 (24,000 ft), and maintained the same relative heading, airspeed and altitude for about 2.5 hours. The airplane was handled by the Miami Air Route Traffic Control Center (ZMA) as it entered an area of overlapping radar coverage. The overlapping facilities were ZMA, Nassau Approach Control, and Grand Turks Radar.

ZMA management reported that radar targets transitioning this area at "low" altitude will enter "coast" status for about 1 minute before the targets are fully reacquired. After approximately 3 minutes in a coast status, the ZMA controller attempted to contact N220N without success. There were no further communications with the airplane despite multiple attempts by air traffic control, and no further radar targets that could be associated with the airplane were acquired. The floating debris and fuel sheen were in an area consistent with the airplane's final radar target.

The pilot held a commercial pilot certificate with ratings for airplane single engine land, multiengine land, and instrument airplane. His most recent FAA third-class medical certificate was issued December 12, 2016, and the pilot reported 1,480 total hours of flight experience on that date.

According to FAA records, the airplane was manufactured in 1981. Its most recent annual inspection was completed December 30, 2016 at 4,634.2 total aircraft hours. The airplane was scheduled for a 100-hour inspection to be performed on May 16, 2017.

At 1400, the weather recorded at Linden Pindling International Airport (MYNN), about 80 miles west of the airplane's track, included scattered clouds at 1,200 ft, a broken ceiling at 3,000 ft, and an overcast ceiling at 10,000 ft, calm wind, and visibility 10 statute miles in light rain. The temperature was 26° C, and the dew point was 23° C. The altimeter setting was 29.97 inches of mercury.

Satellite imagery in the area surrounding the airplane's radar track depicted a consistent cloud layer with cloud tops around FL400 (40,000 ft), and upper air soundings confirmed icing

conditions between -10° and -20° C in clouds. At 1340, a PIREP (pilot report) was issued for light to moderate rime icing. The PIREP was received from a Boeing 737 airplane.

Introduction

The logbook forensic analysis of Mr. Ulrich's two logbooks was performed in an effort to ascertain Mr. Ulrich's experience prior to the fatal accident of May 15, 2017 and provide a summary of information for the NTSB.

Mr. Ulrich's family provided two logbooks, both Jeppesen Pilot Logbooks. The Logbook one first entry was October 10, 2002 and last entry was January 12, 2017. Logbook two first entry was January 14, 2017 and the last entry was February 17, 2017.

The following sections of this report document dates and logbook entries of different certificates and ratings acquired by Mr. Nathan Ulrich as well as locations, schools, flight instructors, and in some cases FAA Designated Pilot Examiners Mr. Ulrich used.

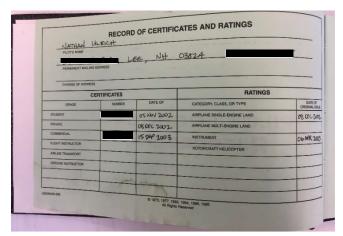
Logbooks Examined

The following photographs document the two Jeppesen Pilot Logbooks of Mr. Nathan Ulrich that were examined for this analysis.

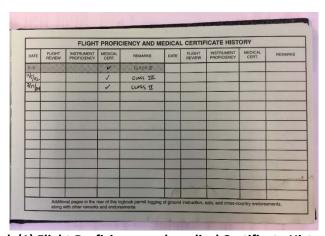
Logbook 1



Nathan Ulrich Jeppesen Pilot Logbook (1) and Cover Page



Logbook (1) Record of Certificates and Ratings Page

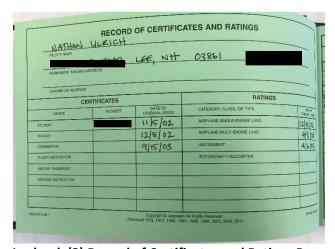


Logbook (1) Flight Proficiency and medical Certificate History Page

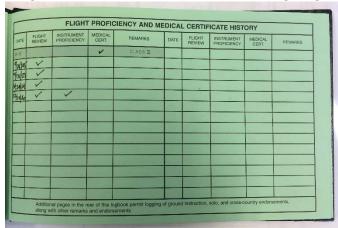
Logbook 2



Nathan Ulrich Jeppesen Pilot Logbook (2) and Cover Page



Logbook (2) Record of Certificates and Ratings Page



Logbook (2) Flight Proficiency and medical Certificate History Page

Private Pilot Flight Training

Mr. Ulrich began primary flight training for his Private Pilot Certificate on October 10, 2002 and flew just about every day through December 8, 2002 and on that day he passed his Private Pilot Practical Test. Mr. Ulrich's primary flight training was in a Cessna 172 Skyhawk at Skyhaven Airport, Rochester, New Hamshire. Mr. Ulrich trained with Ossipee Valley Aviation. Mr. Ulrich's flight instructor was Mr. Peter Seavey of NORTHWOOD, NH 03261-3433.

Mr. Ulrich's solo flight occurred on November 9, 2002 after 10.2 hours of dual instruction.

Mr. Seavey remained Mr. Ulrich's flight instructor through the duration of his Private Pilot practical test and provided each of the required endorsements for solo flights, aeronautical knowledge and private pilot proficiency in preparation for the practical test.

Mr. Ulrich had accumulated 45.1 hours of total time prior to taking his Private Pilot practical test of which 33.3 hours was dual instruction and 11.8 hours were solo flight time.

High Performance Airplane Pilot Flight Training

Mr. Ulrich received ground and flight training in a Cessna 182 Skylane flying a total of 3.6 hours December 18th and 19th, 2002 at Santa Monica Municipal Airport (KSMO), Santa Monica, California. Mr. Ulrich was endorsed by his Flight Instructor as having received ground and flight training in a high performance airplane and found to be proficient in the operation of a high performance airplane per 14 CFR §61.31.

Complex Airplane Pilot Flight Training

Mr. Ulrich received ground and flight training in a Cessna 172RG Cutlass flying a total 3.7 hours of dual instruction at Montgomery-Gibbs Executive Airport (KMYF) in San Diego, California on February 15, 2003. Mr. Ulrich was endorsed by his flight instructor as having received ground and flight training in a complex airplane and found to be proficient in the operation of a complex airplane per 14 CFR §61.31 (e).

Instrument Airplane Pilot Flight Training

On December 12, 2002, Mr. Ulrich began instrument flight training. His training continued with Ossipee Valley Aviation at Skyhaven Airport in Rochester, New Hampshire. Mr. Seavey remained his flight instructor through his instrument rating practical tests

Mr. Seavey endorsed Mr. Ulrich's logbook for the instrument practical test on March 31, 2003. It is not clear from Mr. Ulrich's logbook that he failed his first attempt at the instrument rating practical test. However, Mr. Ulrich received a Notice of Disapproval of Application on April 1, 2003 for Instrument Approach Procedures: Non-Precision Instrument Approach No Gyro.

Mr. Ulrich received additional training in non-precision approaches and no gyro approaches for a total of 2.9-hour total flight time and 2.3 hours simulated instrument training prior to the retest. Mr. Ulrich's

logbook was again endorsed by Mr. Seavey certifying Mr. Ulrich as being prepared for the Instrument Airplane Practical Test. On April 6, 2003, Mr. Ulrich passed the Instrument Airplane Practical Test.

Mr. Ulrich's total times to date prior to receiving his Instrument Rating were:

ASEL	AMEL	Complex	Night	Actual	Simulated	Cross-	Dual	PIC	Total
				Instrument	Instrument	Country			
146.1	1.2	5.9	17.7	14.8	38.3	78.5	107	111.5	147.3

Table 1 - Total Flight Time April 6, 2003

Commercial Pilot Flight Training

Mr. Ulrich began his Commercial Pilot certificate flight training on June 2, 2003. He had a total of 176.1 hours' total time when he began commercial pilot certificate flight training. He received 18.2 hours of dual flight instruction in preparation for his Commercial Pilot certificate practical test. He flew primarily in a Cessna 172 Skyhawk and used the Cessna 172 RG Cutlass occasionally and for his practical test aircraft. Mr. Ulrich's total times prior to taking the Commercial Pilot Practical Test were:

	ASEL	AMEL	Complex	Night	Actual	Simulated	Cross-	Dual	PIC	Total
					Instrument	Instrument	Country			
Γ	248	4.1	18.6	33.8	35.1	38.3	161.4	143.7	213.4	252.1

Table 2- Total Flight Time September 14, 2003

Mr. Ulrich passed the Commercial Pilot Practical Test on September 15, 2003.

Multi-Engine Pilot Flight Training

Mr. Ulrich began his multi-engine training on January 31, 2003, but only acquired 1.2 hours of multi-engine instruction in a Piper Turbo Aztec PA23-250, from Mr. Seavey, but did not continue multi-engine training until he began again in March of 2008.

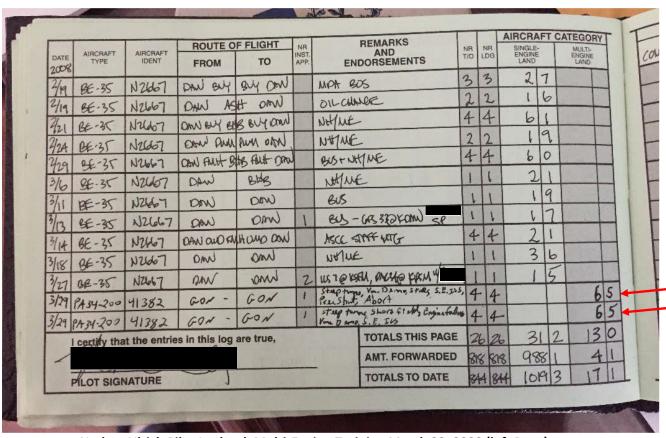
Mr. Ulrich received multi-engine pilot training on March 29 and April 3, 2008 at Groton-New London Airport in a Piper Seneca (PA-34-200) through *Action Multi Ratings* of Groton, Connecticut.

According to Mr. Darrell F. Chappell, who was Mr. Ulrich's Multi-Engine Flight Instructor (CFI-IMEI), he provided two flights on March 29, 2008 for a total of 3 hours of multi-engine instruction which included 0.9 simulated instrument training. During that time, there were two total takeoff and landings. Mr. Ulrich's logbook remarks note that the following maneuvers were flown:

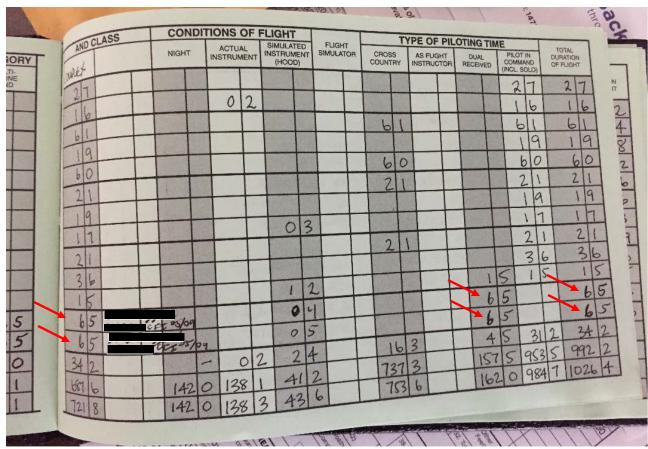
- Steep turns
- VMC Demo
- Stalls
- Single-Engine ILS
- Aborts
- Short Field
- Engine failure

However, Mr. Ulrich's logbook indicates he flew two flights for 6.5 hours each for a total of 13 hours on March 29, 2008. The following columns were altered on two separate lines on March 29, 2008 (indicated by the red arrows):

- Aircraft Category Multi-Engine Land
- And Class Complex
- Type of Piloting Time Dual Received
- Total Duration of Flight



Nathan Ulrich Pilot Logbook Multi-Engine Training March 29, 2008 (left Page)



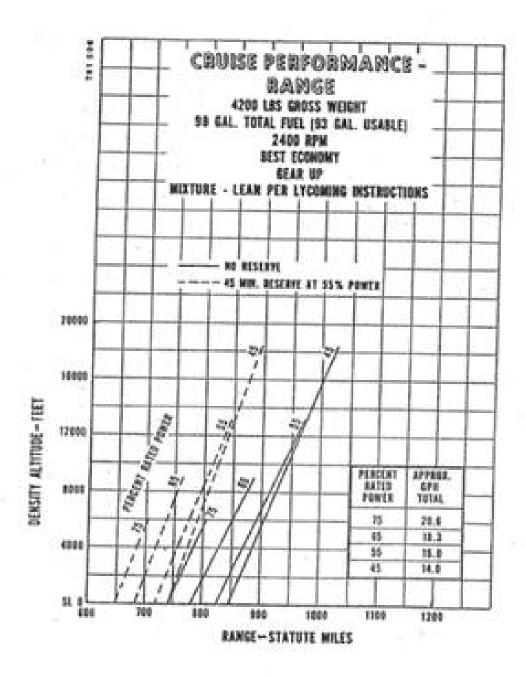
Nathan Ulrich Pilot Logbook Multi-Engine Training March 29, 2008 (Right Page)

FAA Logbook Investigation

Because of the vary large time period of flight instruction in one day, 13 hours¹, and the endurance limits of the Piper Seneca (reference: *Piper Seneca PA-34-300 Pilot Operating Handbook Endurance Chart*), Mr. Chappell of Action Multi-Ratings was contacted to determine if Mr. Ulrich had received 13 hours of flight training from Mr. Chappell.

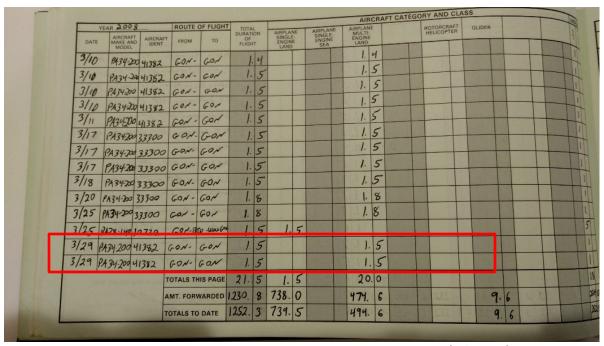
Also, a review of the Mr. Ulrich's Airman Certificate and/or Rating Application (FAA Form 8710-1) for his multi-engine rating was examined. The Airman Certificate and/or Rating Application shows that in block 2a Total Time in Aircraft he noted as a total time of 4.4 hours which would represent his 3 training flights of 1.5, 1.5, and 1.4 hours respectfully.

¹ Piper Seneca PA-34-300 has a maximum endurance of 7 hours with 98 gallons total available at 45 percent power.

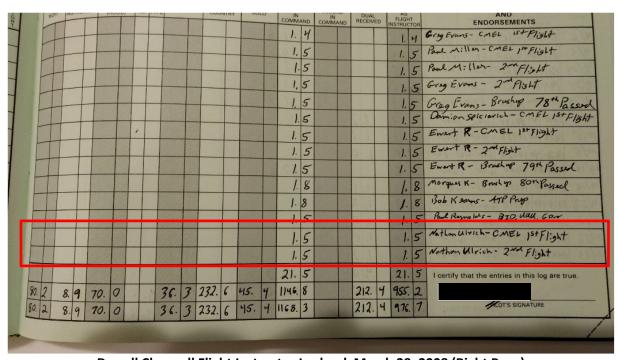


Piper Seneca PA-34-300 Pilot Operating Handbook Endurance Chart

A careful examination of the writing in Mr. Ulrich's logbook and discussions with Mr. Chappell found that Mr. Ulrich's logbook had been altered at some point after Mr. Chappell had endorsed the logbook. Mr. Chappell provided logbook records to substantiate his flight time with Mr. Ulrich. A review of Mr. Chappell's logbook pages indicated that he only flew with Mr. Ulrich two times on March 29, 2008 for a total of 3 hours.



Darrell Chappell Flight Instructor Logbook March 29, 2008 (left Page)



Darrell Chappell Flight Instructor Logbook March 29, 2008 (Right Page)

Mr. Ulrich also received multi-engine pilot training from Ms. Beth Ellis on April 3, 2008. Ms. Ellis was the recommending instructor and flew with Mr. Ulrich for 1.4 hours which included 0.6 hours simulated instrument. Ms. Ellis noted in the pilot logbook remarks that the following maneuvers were performed:

- Abort take-off
- Engine failure
- Steep turns
- Slow flight
- Landing stall
- Engine s/o

On the same day that Mr. Ulrich flew with Ms. Ellis, he received his multi-engine rating from Designated Pilot Examiner (DPE), Mr. Byron D. Degroff. Mr. Degroff flew with Mr. Ulrich for 1.2 hour with 0.3 hour simulated instrument. Mr. Degroff is deceased.

Multi-Engine Experience Post-Rating

Mr.Ulrich did not fly any multi-engine aircraft again until December 19, 2016 (8 years later), and flew four flights in a Diamond DA42 Twinstar of which two flights were with an instructor on cross-country flights followed by two additional cross-country flights during which he logged 11.5 hour as PIC. These four flights were with the Academy of Aviation in Farmingdale, New York located at Republic Airport (KFRG).

For: Nathan Ulrich

PIC / SIC	Ticket	Tuna	Type Ta	Tail No.	Type	Departure	Flore	Ctoff	Staff Dual –	Landings		Hours		Apch S	Sylbe	Course	Stage	o I ocn	
SIC	TICKEL	Type	Tall NO.	туре	Departure	Liaps	Duan Duan D	Ctail Buai		Day	Nite	Day	Nite	IMC	Hood	Арсп	Sylbs	Course	Stage
PIC	128796	Rental	N906ER	DA42_L360	12/24/16 07:00	10.50			1	0	10.50				0			0	0
PIC	128469	Rental	N906ER	DA42_L360	12/19/16 13:00	1.70	Brown	1.70	1	0	1.70				0			0	0
PIC	128433	Rental	N904ER	DA42_L360	12/19/16 07:00	2.40	Brown	2.40	1	0	2.40				0			0	0
	Total This Page							4.10	3	0	14.60				0				

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Academy of Aviation Customer Records - Nathan Ulrich

Mr. Ulrich had accumulated a total of 21.2 hours of multi-engine aircraft time. A breakdown of his multi-engine aircraft time is shown below:

Date	A/C Type	ME Duration	Simulated Instrument	Actual Instrument	Dual	PIC	X-Country
3/29/2008	PA-34	1.5	0.4		1.5		
3/29/2008	PA-34	1.5	0.5		1.5		
4/3/2008	PA-34	1.4	0.6		1.4		
4/3/2008	PA-34	1.2	0.3			1.2	
12/19/2016	DA-42	2.4			2.4	2.4	2.4
12/19/2016	DA-42	1.7	0.6		1.7	1.7	1.7
12/24/2016	DA-42	6.1		0.3	6.1	6.1	6.1
12/25/2016	DA-42	5.4			·	5.4	5.4
Total Hours		21.2	2.4	0.3	14.6	16.8	15.6

Nathan Ulrich Logbook Flight Hours by Category

It should be noted that there is a one-hour discrepancy between Mr. Ulrich's total multi-engine time recorded on his cross-country flight to Savanah, Georgia (KSAV) and back to Republic airport (KFRG) lowering his total multi-engine time to 20.2 hours and his PIC multi-engine total time to 15.8 hours.

N220N Mitsubishi MU-2 Flight Training

Mr. Ulrich began instructional flights in N220N on January 5, 2017 having accumulated a logbook total of 21.2 hours of multi-engine flight hours of which 16.8 hours where Pilot-in-Command and 14.6 hours were with a flight instructor.

Mr. Ulrich'c cumulative flight hours prior to beginning training in accordance with Special Federal Aviation Regulation (SFAR) 108 are:

ASEL	AMEL	Complex	Night	Actual	Simulated	Cross-	Dual	PIC	Total
				Instrument	Instrument	Country			
1379.7	25.3*	1031.5	180	152.5	46.8	1055.8	165.6	1361.9	1405

^{* 10-}hour correction (reduction) from what is in the actual logbook to correct for the logbook alteration effecting the following: AMEL, Complex, Dual, and Total Duration

Mr. Ulrich began flight training in N220N with Howell Enterprises, Inc. of 37167 to meet the requirements of 14 CFR Part 91.1705.

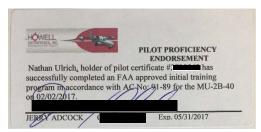
Mr. Ulrich began logging dual instruction and PIC in the MU-2B N220N on January 5, 2017.

During the month of January 2017, Mr. Ulrich accumulated 50.6 hour of MU-2B flight training including 3.2 hours of actual instrument flight time. Almost all of his flights were cross-country flights totaling 42.5 hours.

Mr. Ulrich flew two instructional cross-country flight to Rafael Hernandez Airport (TJBQ), Aguadilla, Puerto Rico stopping part way on the first flight (January 5, 2017) at Aiken Municipal Airport, Aiken, South Carolina and Fort Lauderdale Executive Airport, Fort Lauderdale, Florida. Mr. Ulrich returned to the same airports, but continued to Teterboro Airport (KTEB), Teterboro, New Jersey. On the second flight, Mr. Ulrich flew to Space Coast Regional Airport (KTIX), Titusville, Florida and then on to Rafael Hernandez Airport, Aguadilla, Puerto Rico and returned to KTEB via KTIX.

Mitsubishi MU-2B Pilot Proficiency Endorsement

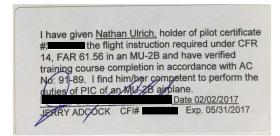
Certified Flight Instructor, Mr. Jerry Adcock, endorsed Mr. Ulrich's logbook on February 2, 2017 as having successfully completed an FAA approved initial training program in accordance with Advisory Circular No: 91-89 for the MU-2B-40.



Flight Instructor Endorsement IAW AC No: 91-89 for the MU-2B-40

Mitsubishi MU-2B Training Course Completion Endorsement

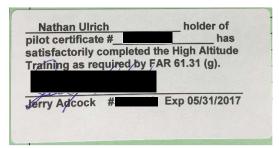
Mr. Adcock also endorsed Mr. Ulrich's logbook on February 2, 2017 as having verified the training course completion in accordance with Advisory Circular No: 91-89 for the MU-2B-40. Mr. Adcock found Mr. Ulrich competent to perform the duties as a PIC in the Mitsubishi MU-2B airplane.



Flight Instructor Endorsement IAW AC No: 91-89 for the MU-2B-40

High Altitude Training

Certified Flight Instructor, Mr. Jerry Adcock, endorsed Mr. Ulrich's logbook as having satisfactorily completed High Altitude Training as required by FAR 61.31 (g). The endorsement is **not** dated. However, it is below an endorsement for the a FAR 61.56 (a) and 61.57 (a)(b)(d) Flight Review. Therefore, it is presumed that this endorsement occurred on either February 1st or 2nd, 2017.



High Altitude Training Endorsement

Post Mitsubishi MU-2 Ground and Flight Training

Mr. Ulrich logged five flights as PIC. During those five flights, Mr. Ulrich logged 10.2 hours of MU-2B PIC including 0.8 hr actual instrument, and 9 hr of cross-country flight time.

Summary

Mr. Nathan Ulrich had the appropriate FAA certificate, rating, endorsements, and pilot currency to operate the Mitsubishi MU-2B as the Pilot-in-Command on May 15, 2017.